What is claimed is:

1. A system for modeling seafloor conductivity, the system comprising a plurality of units deployed at different locations on the seafloor, each unit comprising:

an assembly, including a frame for supporting a plurality of electrodes, the assembly configured for resting on the seafloor;

a pair of electrodes, mounted in relation to the frame in vertical displacement from one another, to form a dipole, wherein each electrode of the dipole is in electrical communication with an output providing a signal that is induced by vertical electric fields present near the seafloor.

2. The system of claim 1, wherein a lower electrode of the pair of electrodes is mounted so that it is positioned above the frame.

3. The system of claim 1, wherein the pair of electrodes are disposed on a substantially rigid arm attached to the frame.

4. The system of claim 3, wherein the arm has a length in the range of 1 to 2 meters.

5. The system of claim 1, further comprising a second pair of electrodes, mounted in relation to the frame in vertical displacement from one another, to form a second dipole, wherein each electrode of the second dipole is in electrical communication with a second output providing a signal that is induced by vertical electric fields present near the seafloor.

6. The system of claim 5, further comprising a cable coupled to the frame, wherein the second dipole is mounted to the cable and the displacement between the electrodes in the second pair is substantially greater than the displacement between the electrodes in the first pair.

7. The system of claim 1, wherein the electrodes are mounted on a cable attached to the frame and further comprising a float disposed at a distal end of the cable.

8. The system of claim 1 further comprising:

at least two magnetic field induction sensors disposed horizontally on the frame orthogonal relative to each other.

9. A system for modeling electrical conductivity of the seafloor, the system comprising a plurality of units deployed on the seafloor, each unit comprising:

a frame adapted for deployment to the seafloor;

a pair of horizontal dipoles extending from the frame in an orthogonal orientation relative to each other for generating a pair of first electric field signals;

a pair of vertically-displaced electrodes extending vertically from the frame and vertically displaced relative to each other to form a vertical dipole for generating a second electric field signal;

at least one first amplifier in electrical communication with the horizontal and vertical dipoles for amplifying each of the first and second electric field signals, the first amplifier having a low input impedance and high gain;

a data logging processor in electrical communication with each of the first amplifier for receiving amplified electric field signals and storing data representative thereof;

a clocking device for synchronizing operation of the data logging processor with other data logging processors on other units within the system;

a power supply in electrical communication with the data logging processor, the clocking device and the first and second amplifiers;

at least one housing for enclosing the data logging processor, the clocking device, the first amplifier and the power supply, the at least one housing adapted for corrosion and pressure resistance in seawater;

means for deploying the unit to the seafloor; and

means for retrieving the unit from the seafloor.

10. The system of claim 9, wherein a lower electrode of the pair of second electrodes is positioned at a height above the frame.

11. The system of claim 9, wherein the vertically-displaced electrodes are disposed on a substantially rigid arm attached to the frame.

12. The system of claim 11, wherein the substantially rigid arm has a length in the range of 1 to 2 meters.

13. The system of claim 11, further comprising:

a cable attached to and extending from the frame;

a float disposed at a distal end of the cable; and

a second vertical dipole comprising a second pair of vertically-displaced electrodes disposed on the cable for generating a third electric field signal, wherein the second vertical dipole is substantially longer than the first vertical dipole, and wherein the second vertical dipole is in electrical communication with the at least one first amplifier.

14. The system of claim 9, wherein the vertically-displaced electrodes are disposed on a cable and further comprising a float disposed at a distal end of the cable.

15. The system of claim 9 further comprising:

at least two magnetic field induction sensors disposed horizontally on the frame orthogonal relative to each other;

a second amplifier disposed within the at least one housing in electrical communication with the induction sensors for amplifying a magnetic field signal generated by each induction sensor; and

wherein the second amplifier is connected to the power supply and provides an amplified magnetic field signal to the data logging processor.

16. A method for modeling seafloor conductivity, comprising:

deploying a plurality of units at different locations in an area of interest on the seafloor, wherein each unit includes:

an assembly including a frame for supporting a plurality of electrodes, the assembly configured for resting on the seafloor;

a pair of electrodes, mounted in relation to the frame in vertical displacement from one another, to form a first vertical dipole, wherein each electrode of the dipole is in electrical communication with an output providing a signal that is induced by vertical electric fields present near the seafloor;

using the units to sense horizontal and vertical electric fields over a pre-selected spectrum;

collecting data corresponding to the sensed electric fields from each of the plurality of units; and

generating a model of resistivity using the collected data.

17. The method of claim 16, wherein each unit includes a second pair of electrodes, mounted on a cable attached to the frame, in vertical displacement from one another by an amount greater than the vertical displacement between the first pair of electrodes and forming a second vertical dipole.

18. The method of either claim 16 or 17, further comprising:

towing an EM transmitter close to the seafloor within the area of interest;

wherein the step of sensing comprises detecting electric fields generated by the EM transmitter.

19. The method of claim 16, wherein the assembly is further adapted for measurement of magnetic fields.

20. A method of exploring seafloor conductivity, comprising:

using, at a plurality of locations, a plurality of vertically spaced electrodes, to provide a signal induced by vertically oriented fields at each location; and

obtaining a measurement at each of the locations associated with the signal thereat.